GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

October 31, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Dirty Socks, October 31, 2011," for your review. Please refer any comments you may have on the document to me by January 3, 2012. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: DIRTY SOCKS

Report Date: October 31, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Dirty Socks was audited on October 31, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) **AUDIT**

Date of report:	10/31/11					
Date:	10/31/11			Site name: 1	Dirty Socks	
Start:	10:10hrs. PS	ST			Steve Mobley	
Finish:	10:30hrs. PS	ST		Project: 5	SB 270	
Audited By:	Mike Horn			Site Elevation:	3590	ft.
Witness:	Steve Mobley			Amb. Pres.:	899.70	hPa
				Amb. Temp.:	15.1	deg. C
Prop. or Serial No.:	225500			Make:	R & P	
Type:	PM-10			Model:	1400ab	
				Last cal. date:	8/17/11	
	AUD	IT DEVICE(S)				
Make:	BGI Incorporated			Make: 1	BGI Incorporated	
Model:	DELTA CAL			Model: 1	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	m		Range:	2 - 20	lpm
a	Calibration Factors				Calibration Factor	s
Slope:				Slope:	1.00	
Intercept:				Intercept:	0.00	
Cal date:				Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:		0.300	16.9	1.8	898.53	-1.2
Dark current:	•	N/A				
	$Qa = [dPxTa/Pa]^{1/2} + b$		Site		Nominal	Flow Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.89	16.89	16.66	-1.4	15.0	18.4
Bypass/Aux Flow Rate	13.87	13.87	13.66	-1.5		
Main Flow Rate	2.98	2.98	3.00	0.7	2.7	3.3
Total Flow Rate	16.98	16.98	16.66	-1.9	15.0	18.4

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt Variable	Evaluation Criteria
Wind Speed		At ws \leq 5 m/s, input \pm 0.25 m/s; At ws $>$ 5 m/s, input \pm 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input \pm 0.5° C Gravimetry Lab \pm 1.0 deg. C input \pm 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitation	1	input ± 10%
Barometric l	Pressure	Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE

	Serial #	Cal Date:	Slope:	Intercept:	
BGI Delta CAL:	123	1/24/11	1.0	0.0	
BGI Delta CAL:	525	1/4/11	1.0	0.0	
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209	
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0	
RM Young wind speed motor:	CU10, HS10	8/30/11	N/A	N/A	
Psychro-Dyne Psychrometer:	RH 04	N/A	1 0	1 0	
Texas Electronics FC-525 Precipitation:	52202	N/A			
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6	

				Air Pollution Co		er esse escarsas.		
				W AUDIT	0.000		****	91
		T	1	1		T	1	T
						0 1		+-
Date:	10/3//1/		1	Site Name	: 10 ml	Vach	·	\vdash
Start:	10:10	PST		Operator		mari	-	╁
Finish:	10:30	PST			: SB270	morey		-
	14			Site Elevation		ft		ļ
		-	The seminar masses	Amb. Press.		in. Hg		
				Amb. Temp.	V L L	deg. C		
				Transcriting.	101	ueg. c		ļ
Prop. Or Ser. No.:	22508	1		Make	R&P			-
	PM10	1			1400a			-
		-	 	Last Cal. Date			ļ	-
		1		Lust Gar. Date.	6//1///			-
		Audit	Device(s)		/ /	 		
Make:	DCT THEOD			Make:	DOT THOSE	2000	ļ	
	BGI INCOR	PUKAL	tu	Model:	THE SECTION AND ADDRESS OF THE PARTY AND ADDRE	REORATED		
S/N:	DELTA CAL	16	 		DLL IN UNI	Υ		
Range:	V123 5	<u> </u>	ļ	S/N:				
Calibration factors:	2 - 20	lpm		Range:	2 - 20	Ipm		
		ļ	Calib	ration factors:				
Slope:	1.0			Slope:				
Int.:	0_0_/	,		Int.:	0.0			
Cal Date:	1/4/1	/	ļ	Cal Date:				
Q _a =m[d	PxT _a /P _a] ^{1/2} +b		Altitude Corr	ection Factor:	÷1013			
Leak Check-Initial	Main:	.05	Aux:	5A3				** **
Leak Check-Final	Main:	- Alle Marie	Aux:	12				
	1			1				
			Site	1	Nominal F	low Rates		-
Audit	Audit Flow	Rate	Flow Rate	Diff.	Lower Limit	Upper Limit		
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		_
Total Fow Rate	16.89		3 66/13.	66-16.64		18.4		_
Aux. Flow Rate	13,87		13.66	22 16.0		.0.4		
Main Flow Rate	2.98		3.00		2.7	3.3		
Total Flow Rate	16.98		9, ,		15.0	18.4		
	16.10		16.66-		10.0	10.4		
			Stan	dard				
	Sampler		True	Raw				
Amb Temp	11.9		1140	121				_
Amb Press	in		898.53	6800				
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Comments:								
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Comments:								
Comments:								

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

July 15, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Dirty Socks, July 15, 2011," for your review. Please refer any comments you may have on the document to me by September 15, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: DIRTY SOCKS

Report Date: July 15, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Dirty Socks was audited on July 14, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	7/15/11					
Date:	7/14/11			Site name: I	Dirty Socks	
Start:	11:30hrs. PST			Operator: S	Steve Mobley	
Finish:	11:50hrs. PST			Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3590 ft	
Witness:	Steve Mobley			Amb. Pres.:	887.20 h	Pa
				Amb. Temp.:	28.9 de	eg. C
Prop. or Serial No.:	225500			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	5/11/11	
	AUDIT	DEVICE(S)				
Make: I	3GI Incorporated			Make: H	BGI Incorporated	
Model: I	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lpm			Range:	2 - 20 lp	<mark>om</mark>
	Calibration Factors				Calibration Factors	
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.040	0.120	27.7	-1.2	885.36	-1.8
Dark current:	N/A	N/A				
($Qa = [dPxTa/Pa]^{1/2} + b$		Site		Nominal F	low Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.99	16.99	16.66	-1.9	15.0	18.4
Bypass/Aux Flow Rate	13.96	13.96	13.66	-2.1		
Main Flow Rate	3.07	3.07	3.00	-2.3	2.7	3.3
Total Flow Rate	16.96	16.96	16.66	-1.8	15.0	18.4

Comments: None.

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE	Serial #	<u>Cal Date:</u>	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	ent Variable	Evaluation Criteria
Wind Speed	d	At ws \leq 5 m/s, input \pm 0.25 m/s; At ws $>$ 5 m/s, input \pm 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direc	rtion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatu	re	input \pm 0.5° C input \pm 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	umidity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitatio	n	input $\pm 10\%$
Barometric	Pressure	Ambient: input \pm 10 hPa TEOM: \pm 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

			asin Unified A Element Oscil					
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	1 .	1		1	- 1	0 0		
Date	: 7/14/11			Site Name	: NSIAT.	1.1	-	+
Start		PST		Operator		mey.	ļ	-
Finish		PST			: SB270	Moore	1	
	11.00	1.01		Site Elevation		10		
		 		Amb. Press.		in. Hg		.
		-			0 0 1 1			!
		 		Amb. Temp.	2.819	deg. C		
Prop. Or Ser. No.:	11/ 100		-		000			
	22508 PM10				: R&P			
туре.	PINIU				: 140ga			
		-		Last Cal. Date	5/11/11			
			1		111			
		Audit	Device(s)					
	BGI INCOR	PORAT	ED.	Make:		RPORATED		
model:	DELTA CAL		1	Model:	DEL TA CAL			
S/N:	0123 52	5		S/N:	0123			1
Range:	0123 52 2 - 20	Ipm		Range:	2 - 20	Ipm	 	
Calibration factors:	- LM		Calib	ration factors:				1
Slope:	1.0			Slope:				1-
Int.:	0.0.			Int.:		 		
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0	PxT _e /P _e] ^{1/2} +b		****					
o ₄ −m[c	PXI Paj +b		Altitude Corre	ection Factor:	-1013			
Leak Check-Initial	Main:	.04	Aux:	.12				7 >>>
Leak Check-Final	Main:	<u> </u>	Aux:					1
			Site		Nominal F	low Rates		1
Audit	Audit Flow	Rate	Flow Rate	Diff.	Lower Limit	Upper Limit		
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		†
Total Fow Rate	16 99		A 114	6= 16 66	15.0	18.4		-
Aux. Flow Rate	13.96		13,66	0-16. pl	10.0	10.4		
Main Flow Rate			3.00		2.7			
Total Flow Rate			The same of the sa			3.3		ļ
Total How Mate	16.96	_,	16.66		15.0	18.4		L
			Stand					
And T	Sampler		True	Raw				
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GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

May 10, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Dirty Socks, May 10, 2011," for your review. Please refer any comments you may have on the document to me by July 11, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: DIRTY SOCKS

Report Date: May 10, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Dirty Socks was audited on May 9, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	5/10/11					
Date:	5/9/11			Site name:	Dirty Socks	
Start:	10:10hrs. P	ST		Operator:	Steve Mobley	
Finish:	10:25hrs. P	ST		Project:	SB 270	
Audited By:	Mike Horn			Site Elevation:	3590	ft.
Witness:	Steve Mobley			Amb. Pres.:	884.80	hPa
				Amb. Temp.:	14.5	deg. C
Prop. or Serial No.:	225500			Make:	R & P	
Туре:	PM-10		×	Model:	1400ab	
				Last cal. date:	2/23/11	
	AUE	OIT DEVICE(S)				
Make:	BGI Incorporated			Make:	BGI Incorporated	
Model:	DELTA CAL			Model:	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lg	om		Range:	2 - 20	lpm
	Calibration Factors				Calibration Factor	rs
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.000	0.050	14.1	-0.4	881.31	-3.5
Dark current:	N/A	N/A				
	$Qa=[dPxTa/Pa]^{1/2}+$	b	Site		Nominal	l Flow Rates
Audit	Audit Flo	w Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.91	16.91	16.67	-1.4	15.0	18.4
Bypass/Aux Flow Rate	13.94	13.94	13.67	-1.9		
Main Flow Rate	3.07	3.07	3.00	-2.3	2.7	3.3

Comments: None.

16.96

16.96

16.67

-1.7

15.0

18.4

Total Flow Rate

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	ent Variable	Evaluation Criteria
Wind Speed	d.	At ws \leq 5 m/s, input \pm 0.25 m/s; At ws $>$ 5 m/s, input \pm 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direc	etion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatu	re	input \pm 0.5° C input \pm 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	umidity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitatio	n	input $\pm 10\%$
Barometric	Pressure	Ambient: input \pm 10 hPa TEOM: \pm 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

	Т	apered	Element Oscil	lating Microba	lance (TEOM)		
				TIDUA W		de se se e	ರ್ಷ-೧೮೮/೩೮೮೪
	110 127				0.1	. 1	
Date:				Site Name	Nux?	Lache	
Start:	10:16	PST		Operator	The	mobile	
Finish:	11195	PST			: SB270 /	THE	
	10.20			Site Elevation		ft.	
		1		Amb. Press.		ft in. Hg	- automan (1991)
	1	1		Amb. Temp.:	15.0	deg. C	1
		1			10.0	uog. o	
Prop. Or Ser. No.:	2250	X	1	Make:	R&P		
	PM10				1400a		
		(4)		Last Cal. Date:			
					1/23/11		
***		Audit	Device(s)			-	1
Make	BGI INCOR			Make:	DCT THEOL	DODATES	
Model:	DEL TA CAL	EUKAL	Qυ	Model:		KENKATED	
S/N:	DELTA CAL	15		S/N:	LILL IN WATER	1	ļI
Range:	0123	Ipm		The second secon		I m vis	
Calibration factors:	2 - 20	lpm	C-85	Range: ration factors:	2 - 20	libm	
		-	Calibi	agents amost decision was been pro-			
Slope:	1.0			Slope:			
Int.:	0,0			Int.:	0.0-		
Cal Date:	1/4/11	1		Cal Date:		ş	
	5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			I			1/0
Q _a =m[d	PxT_/P_J ^{1/2} +b		Altitude Corre	ection Factor:	- 1013		
Leak Check-Initial	Main:	,00	Aux:	. 05			
Leak Check-Final	Main:		Aux:				
			Site		Nominal F	low Rates	
Audit	Audit Flow	Rate	Flow Rate	Diff.	Lower Limit	Upper Limit	
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Fow Rate	16.91		3.00/13.6	7=16.6	15.0	18.4	
Aux. Flow Rate	13.94		13:67				
Main Flow Rate	13.89		3.00		2.7	3.3	
Total Flow Rate	10.96		16.67		15.0	18.4	
	-KA-17		16:0-				
			Stan	dard			
	Sampler		True	Raw			
Amb Temp	14.1	2000		15 *			
Amb Press			881.31	\$21P			
71110 1 1603	- 870		001.21	004.0			
Comments:							
							10

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE:

January 26, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Dirty Socks, January 26, 2011," for your review. Please refer any comments you may have on the document to me by March 28, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

SITE: DIRTY SOCKS

Report Date: January 26, 2011 Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Dirty Socks was audited on January 25, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

2.0 Parameters Audited:

T.E.O.M. PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) ${\bf AUDIT}$

D	a locales						
Date of report:	1/26/11						
Date:	1/25/11			Site name:	•		
Start:	13:00hrs. I			*	Steve Mobley		
Finish:	13:20hrs. I	PST		Project:	SB 270		
Audited By:	Mike Horn			Site Elevation:	3590	ft.	
Witness:	Steve Mobley			Amb. Pres.:	895.80	hPa	
				Amb. Temp.:	14.5	deg. C	
Prop. or Serial No.:	225500			Make:	R & P		
Type:	PM-10			Model:	1400ab		
				Last cal. date:	11/5/10		
	AUI	OIT DEVICE(S)					
Make: BGI Incorporated				Make: BGI Incorporated			
Model: DELTA CAL				Model:	Model: DELTA CAL		
S/N:	525			S/N:	525		
Range:	2 - 20 1	pm		Range:	2 - 20	lpm	
Calibration Factors				Calibration Factors			
Slope:	1.00			Slope:	1.00	2	
Intercept:	0.00			Intercept:	0.00		
Cal date:	1/4/11			Cal Date:	1/4/11		
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.	
Leak check:	-0.010	-0.030	13.7	-0.8	894.48	-1.3	
Dark current:	N/A	N/A					
	Qa=[dPxTa/Pa] ^{1/2} +	b	Site		Nominal	Flow Rates	
Audit	Audit Flow Rate,		Flow Rate	Diff.	Lower Limit	Upper Limit	
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Flow Rate	17.06	17.06	16.67	-2.3	15.0	18.4	
Bypass/Aux Flow Rate	14.00	14.00	13.67	-2.4			
Main Flow Rate	3.00	3.00	3.00	0.0	2.7	3.3	
Total Flow Rate	17.01	17.01	16.67	-2.0	15.0	18.4	

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremen	nt Variable	Evaluation Criteria
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input \pm 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input \pm 0.5° C input \pm 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input \pm 5% RH, \pm 1.5°C as dew point Gravimetry Lab: input \pm 5%
Precipitation	ı	input ± 10%
Barometric l	Pressure	Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input \pm 10%; Design Flow \pm 10% input \pm 4%; Design Flow \pm 5%
TEOM:	Total Flow Main Flow Bypass Flow	input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10% input \pm 10%; Design Flow \pm 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE

	<u>Serial #</u>	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	12/22/09	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		

10 10 100			asin Unified A				
		ahered	Element Oscil		nance (TEOM)	11.11.715.154.040	ere reservo v
		т	FLO	W AUDIT	·		
				4			
D-4					In A	0 //	
Date:	11111111			Site Name		Jacke	
Start:	1	PST		Operator		mobile	
Finish:	13:26	PST			: SB270 (/		
· · · · · · · · · · · · · · · · · · ·				Site Elevation		ft	1
				Amb. Press.		in. Hg	T
				Amb. Temp.	14.5	deg. C	
		-			ui limite		
Prop. Or Ser. No.: Type:	22508	1		Make			
Type:	PM10		L		1400a		
				Last Cal. Date:	11/5/16		
		******	Device(s)				
Make:		PORAT	ED	Make:	BGI INCOM	RPORATED	1
Model:	DELTA CAL	- LTV-184		Model:	DELTA CAL	aranta Libite	
5/N:	0123 52	5		S/N:	0123		1
Range:	0 123 52 2 - 20	lpm		Range:	2 - 20	lpm	
Calibration factors:			Calib	ration factors:	2 - 20	T*************************************	
Slope:	1.0		T	Slope:	1.0		
Int.:	0.0			Int.:	0.0		
Cal Date:	114/11			Cal Date:	0.0	1	
	- th 44 m						
Q.=m[d	IPxT _a /P _a J ^{1/2} +b		Altitude Corn	ection Factor:	÷1013		
		-			. 1012		
Leak Check-Initial	Main:	-01	Aux:	13			
Leak Check-Final	Main:	.01	Aux:	.07			
TARRELINE O.							
······································			Site		Nominal F	low Dates	
Audit	Audit Flow	Rate	Flow Rate	Diff.	Lower Limit	Upper Limit	
Point		(VLPM)		(%)	(LPM)		
Total Fow Rate		(• 1-1 141)		(70)		(LPM)	
Aux. Flow Rate	1206		7.60/13.6	1 = 16.6	7 15.0	18.4	Lace Indian
Main Flow Rate	14.0		13.67				
Total Flow Rate	3.60		3.60		2.7	3.3	
Total Flow Rate	17.6)		16.67		15.0	18.4	
			1				
••			Stan				
Amb Temp	Sampler		True	Raw			
	13.7			14.5			
Amb Press	883		89448	895.8			
Comments:							
Comments:							
Comments:							
Comments:							
	,						